

Acronyms and Abbreviations

ADC	analog-to-digital converter
AGC	automatic gain control
AM/AM	amplitude-modulation-to-amplitude-modulation
AM/PM	amplitude-modulation-to-phase-modulation
ASIC	application-specific integrated circuit
AWGN	additive white Gaussian noise
BCH	Bose–Chaudhuri–Hocquenghem
BPSK	binary phase-shift keying
BT	bandwidth–time (product)
Caltech	California Institute of Technology
CCSDS	Consultative Committee for Space Data Systems
CIC	cascaded integrator comb
CLF	conditional-likelihood function
CMOS	complementary metal oxide semiconductor
CPFSK	continuous phase frequency-shift keyed
C-R	Cramer–Rao

CRB	C-R bounds
CRC	cyclic redundancy check
CSSS	cross-spectrum symbol synchronizer
CTL	carrier-tracking loop
CW	continuous wave
DAC	digital-to-analog converter
dB	decibel(s)
DESCANSO	Deep Space Communications and Navigation Systems Center of Excellence
DMF	derivative matched filter
DSN	Deep Space Network
DTTL	data-transition tracking loop
EDL	entry, descent, and landing
ESA	European Space Agency
FEC	forward error-correcting
FFT	fast Fourier transform
FMF	frequency-matched filter
FPGA	field programmable gate array
GLRT	generalized likelihood ratio test
GMSK	Gaussian-filtered minimum-shift keying
I	in-phase
I&D	integrate-and-dump
IEEE	Institute of Electrical and Electronics Engineers
IF	intermediate frequency

iid	independent, identically distributed
I-Q	in-phase–quadrature
JPL	Jet Propulsion Laboratory
kbps	kilobit(s) per second
ksps	kilosymbol(s) per second
LDTTL	linear data-transition tracking loop
LF	likelihood function
LLF	log-likelihood function
LPF	low-pass filter
LR	likelihood ratio
MAP	maximum a posteriori
Mbps	megabit(s) per second
MCAS	Micro Communications and Avionics Systems
MF	matched filter
MIT	Massachusetts Institute of Technology
ML	maximum likelihood
MMS	minimum mean-squared
M-PSK	M -ary phase-shift keying
M'-PSK	M' -ary phase-shift keying
MSK	minimum-shift keying
Msps	megasymbol(s) per second
NASA	National Aeronautics and Space Administration
NC-LDTTL	noncoherent linear data-transition tracking loop
NCO	numerically controlled oscillator

nqLLR	normalized quasi-log-likelihood ratio
NRZ	non-return to zero
OQPSK	offset quadrature phase-shift keying
pdf	probability density function
PLL	phase-locked loop
PN	pseudo-noise
PSD	power spectral density
PSK	phase-shift keying
Q	quadrature
QAM	quadrature amplitude modulation
qGLRT	quasi-generalized-likelihood ratio test
qLLR	quasi-log-likelihood ratio
QPSK	quadrature phase-shift keying
RC	resistor capacitor
Res	residual
RF	radio frequency
rms	root-mean-square
RS	Reed–Solomon
RV	random variable
S-band	around 2 GHz
SDR	software-defined radio
SNR	signal-to-noise ratio
SQPSK	staggered quadrature phase-shift keying
SSME	split-symbol moments estimator

ST-2	Space Technology-2
Sup	suppressed
SW	switch
sync	synchronization
T/R	transmitter/receiver
TT&C	telemetry, tracking, and control
UCLA	University of California, Los Angeles
UHF	ultra-high frequency
UQPSK	unbalanced quadrature phase-shift keying
U.S.	United States
USC	University of Southern California
USO	ultra-stable oscillator
VCO	voltage-controlled oscillator
X-band	around 8 GHz